Our English Page : Drift of The Ether(2)

OUR ENGLISH PAGE

Drift of The Ether (2)

(空間エーテルの流れ)

Einstein Theory

No adequate explanation of these two conflicting experiments was produced till 1905, when Einstein put forward his special theory of relativity which disregards the ether altogether. This theory carried with it such revolutionary consequences as to the nature of space and time that men began to question whether there might not be some flaw in the Michelson-Morley experiment, on which such a vast edifice of speculation had been built by Einstein and his disciples. So Professor Miller constructed a more elaborate interference apparatus with all possible precautions and refinements. When he tried it out in the place of the previous experiments, the basement of the building, he got the same result, that is, no adequate evidence of ether drift.

But a few months ago he set up the apparatus on the summit of Mount Wilson, 5,000 feet above the sea, and this time got a positive displacement of the fringes. If Miller's experiment is confirmed it would indicate that the ether is somehow tangled up and carried with the earth at points beneath the surface, like the basement laboratory, but that out on a mountain top, somewhat away from the main mass of the earth, the ether does drift by, or through, matter to some extent. This means that we have in the ether a sort of fixed framework and can, in spite of Einstein, get evidence of real motion and not merely relative motion of the stars and the earth. There is then a definite clash between the results so far obtained by Miller and Einstein's specials relativity theory.

Professor Gale's Experiment

But the paper read before the Academy by Prof. H. C. Gale of the Uuiversity of Chicago, giving the result of the new experiments by Professor Michelson and himself on ether drifts, accords with Einstein's theory instead of contradicting it. In this apparatus divided ray of light was sent in opposite directions through a rectangle of water-pipe over a mile long in order to see if the rotation of the earth made any difference on the speed of light in different directions. The measurements with the interferometer were almost exactly the figure required by the theory of relativity, and Professor Michelson in a preliminary announcement of the result in a recent public lecture in Chicago said: "Provitionally there is no question that the Einstein theory is correct and this experiment is one more striking confirmation of his brilliant work." But this result is also in accordance with the old ether theory so it does not definitely decide between them. Besides, this experiment was performed underground like those in the basement of the Case School and, if Professor Miller's experiments are right, different result may be expected on the mountain tops.

With the possibls exception of Miller's recent results on Mount Wilson the Einstein theory has been substantiated on ali points open to experimental evidence. His prediction of a displacement in the position of stars close to the sun was verified by eclipse observations of Eddington and Campbell of California. His prediction of a shift in the spectral lines from the sun was verified by St. John at Mount Wilson. The theory of relativity also affords an explanation of the irregularities in the orbit of Mercury, the distribution of the fine lines of the spectrum of light as calculated by Sommerfeld, of the results of the Michelson-Morley experiment and of the continued production of heat from the sun and stars by the conversion of their substance into radiant energy.